A NEW SUBSPECIES OF PERENNIAL *LINANTHUS* (POLEMONIACEAE) FROM THE KLAMATH MOUNTAINS, CALIFORNIA

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Abstract

Linanthus nuttallii subsp. **howellii** Nelson & Patterson is described from the serpentine soil of the southern Klamath Mountains of California. It is near *L. nuttallii* subsp. *nuttallii* and subsp. *pubescens* morphologically, differing by its smaller leaf lobes as well as dense pubescence.

During a recent expedition by the first author to the southernmost portion of the Klamath Mountains in Tehama County, California, an unusual population of perennial *Linanthus* was noticed. Further field investigation and examination of herbarium material support the taxonomic distinctness of this population, and it is herein proposed as a new subspecies.

Linanthus nuttallii Milliken subsp. **howellii** Nelson & Patterson, subsp. nov.

Caules, folia et calyces dense brevisetosi; folia divergens ad levitor arcuata, 5–7 partita, segmenta 3.5–7 mm longa; pollinis grana 34–36 μm; chromosomatum numerus $2n = 18$ (Fig. 1).

Herbaceous perennial from woody root crown; stems reclining to slightly ascending at tips, forming a compact mat 7–19 cm in diameter, 4–8 cm high, densely gray pubescent, the trichomes short-bristly; internodes 3–9(–12) mm long; leaves opposite, divergent to slightly arcuate, palmately partite into 5–7 narrowly oblanceolate divisions, 3.5–7 mm long, the trichomes short-bristly, mostly spreading at right angles to the leaf surface; flowers sessile to subsessile in dense subcapitate clusters; calyx narrow-campanulate, trichomes short-bristly, the lobes lanceolate-subulate, pungent, 7–11 mm long; corolla funnelform, white with yellow throat, 8–11 mm long, densely white villous on exterior, the tube included in the calyx; stamens inserted at base of the throat, included to barely exserted;

Madroño, Vol. 32, No. 2, pp. 102–105, 26 April 1985

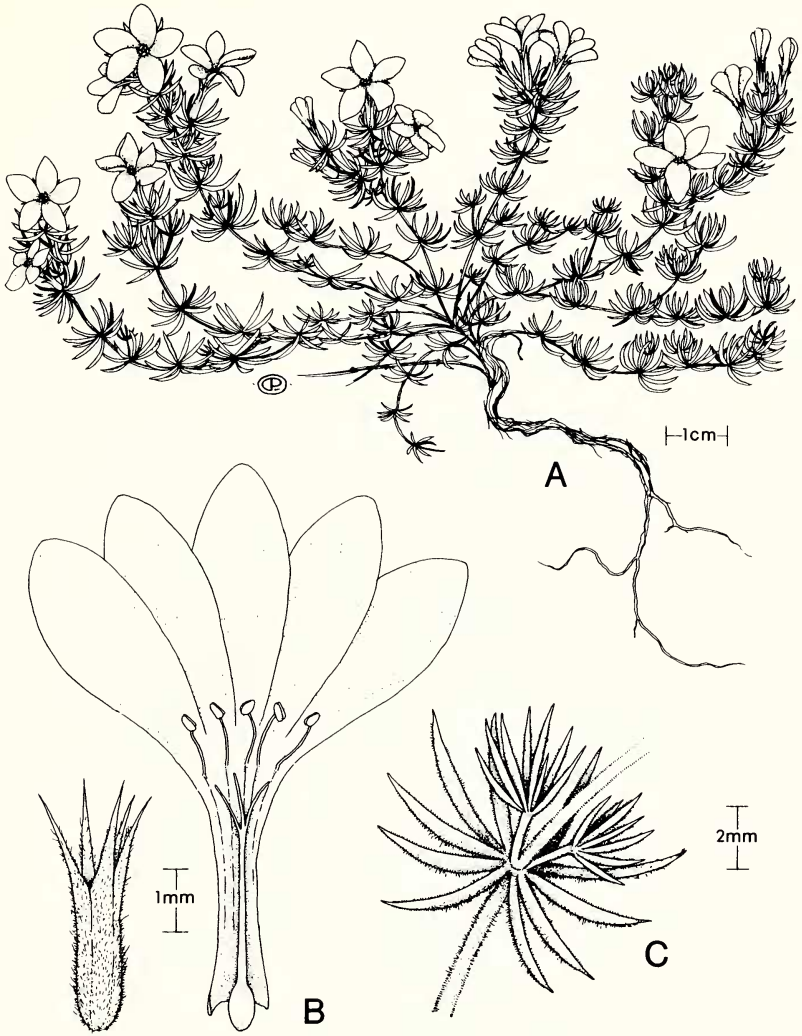

FIG. 1. *Linanthus nuttallii* Milliken subsp. *howellii* Nelson & Patterson. A. Habit. B. Perianth with corolla opened. C. Node showing leaf detail. From *Nelson and Nelson 5847*.

pollen grains 34–36 μm in diameter, yellow; chromosome number $2n = 18$. Flowering period is from June to early July.

TYPE: USA. California. Tehama Co., w. side of Mt. Tedoc along NF road 45, ca. 1.5 miles n. of Tedoc Gap, Yolla Bolly Quad. T28N, R9W, Sec. 28, 1500 m, 22 Jun 1980, *Nelson and Nelson 5847* (Holotype: CAS; isotypes: GH, HSC, MO, NY, OSC, SFSU, WTU).

PARATYPES: USA. California. Tehama Co., nw. side of Tedoc, 16

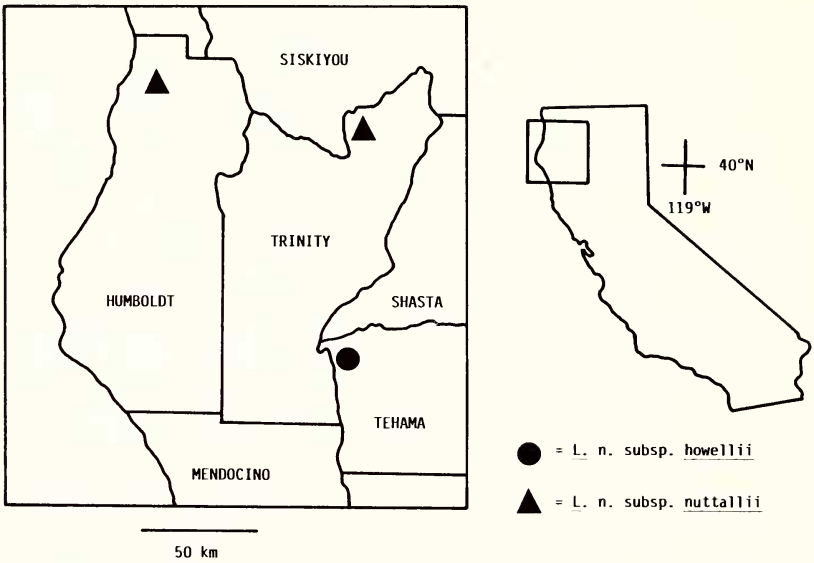

FIG. 2. Map showing distribution of *Linanthus nuttallii* subsp. *howellii* and *L. nuttallii* subsp. *nuttallii* in northwestern California.

Jun 1972, *Stebbins s.n.* (JEPS); slopes of Tedoc Mtn., Tedoc Gap road, 30 Jun 1974, *Lester 338* (HSC); along Tedoc road ca. 10 mi from junction with State route 36, 21 Jul 1978, *Nelson and Nelson 4441* (HSC); along forest road 45 at milepost 11, 25 Jun 1975, *Nelson and Nelson 4930* (JEPS); along forest road 27N13 2.5 mi s. of Tedoc Gap, 1 Jul 1983, *Nelson and Nelson 7436* (CAS); along forest road 27N13 0.7 mi s. of junction with forest road 27N12, 1 Jul 1983, *Nelson and Nelson 7437* (BYU, JEPS, NY, MO); along forest road 27N12 0.3 mi from junction with forest road 27N13, 1 Jul 1983, *Nelson and Nelson 7438* (DAV, RSA).

Distribution. Linanthus nuttallii subsp. *howellii* is apparently very rare. It is limited in distribution to Mt. Tedoc and immediate vicinity in the southernmost Klamath Mountains of western Tehama County, California, at elevations of 1500–1800 m (Fig. 2). It represents the southernmost extension of perennial *Linanthus* in the North Coast Ranges. It is disjunct from the nearest population of subsp. *nuttallii* by 90 km. It is found on serpentine soil in association with Jeffrey pine woodlands where it is often a common understory species.

Linanthus nuttallii subsp. *howellii,* although similar in most features to the other perennial taxa in the genus, is easily distinguished by its low-growing habit, short leaf lobes and dense short-bristly indumentum on stems, leaves and calyces. Typical subsp. *nuttallii*

is usually less hairy overall and possesses longer ((6–)10–32 mm) leaf lobes; subsp. *pubescens,* which is considerably disjunct, generally possesses longer leaf lobes. The newly described species, as are most narrow endemics, is noteworthy for being much less variable morphologically than the other subspecies of *L. nuttallii.*

Pollen grain diameter in subsp. *howellii* presents an additional intriguing problem. The grains of diploid perennial taxa have diameters ranging from 23–28 μm, whereas those of related tetraploid taxa measure 33–38 μm (Patterson 1977). Pollen grains of subsp. *howellii* measure 34–36 μm, well within the range of tetraploid perennials; however, subsp. *howellii* is diploid. This seeming discrepancy cannot be explained readily, and it points out the difficulty in relying on pollen grain diameter measurements in determining polyploid level.

The discovery of the disjunct Tedoc Mountain populations of subsp. *howellii* and the apparent restriction to serpentine soil may be important in interpreting the nature of the entire perennial species complex. Throughout its range, this complex (Sect. *Siphonella*) occurs as a series of disjunct populations, sometimes separated from the nearest population by only a few kilometers. This pattern is suggestive of a formerly more continuous range that has subsequently fragmented. There is no evidence supporting great vagility in perennial *Linanthus* species; hence it is unlikely that the Tedoc populations result from "long" distance dispersal. A possible explanation for the distribution seen is that populations of perennial *Linanthus* represent relict stands that persist due to special features of a given region. Perhaps near Tedoc the ability to survive on serpentine soil allows *Linanthus nuttallii* to persist in this part of its range, some distance south of its nearest population. While this hypothesis is highly speculative it may be worth future study in this group.

The new subsp. of *Linanthus nuttallii* is named for John Thomas Howell, long a student of the California flora and worker with plants of the Tedoc region

Acknowledgments

Appreciation is extended to Jane Nelson, Chris Bern, and Barbara Williams for their assistance in the field, and to the curators of CAS, DS, JEPS, and UC for facilitating access to herbarium material.

Literature Cited

Patterson, R. 1977. A revision of *Linanthus* sect. *Siphonella* (Polemoniaceae). Madroño 24:36–48.

(Received 3 October 1984; accepted 3 December 1984)